

THE
DOMINION EXPERIMENTAL FARMS
(INCEPTEO 1886)

HON. MARTIN BURRELL.
MINISTER OF AGRICULTURE

J. H. GRISDALE, B.AGR.
DIRECTOR

SEASONABLE HINTS

NUMBER 6

NOVEMBER, 1916



In the above outline map, note the locations of the Experimental Farms and Stations. The Superintendent of the Experimental Farm or Station nearest to you will be pleased to give you any information in his power. Why not communicate with him?

SEASONABLE HINTS.**THE DOMINION EXPERIMENTAL FARMS.****Principal Officers.**

Director, Dominion Experimental Farms, Ottawa, Ont.
 Dominion Field Husbandman, Experimental Farm, Ottawa, Ont.
 Dominion Chemist, Experimental Farm, Ottawa, Ont.
 Dominion Horticulturist, Experimental Farm, Ottawa, Ont.
 Dominion Cerealist, Experimental Farm, Ottawa, Ont.
 Dominion Botanist, Experimental Farm, Ottawa, Ont.
 Dominion Animal Husbandman, Experimental Farm, Ottawa, Ont.
 Dominion Forage-Crop Specialist, Experimental Farm, Ottawa, Ont.
 Dominion Poultry Husbandman, Experimental Farm, Ottawa, Ont.
 Dominion Tobacco Husbandman, Experimental Farm, Ottawa, Ont.
 Apiarist, Experimental Farm, Ottawa, Ont.
 Chief Officer, Extension and Publicity, Experimental Farm, Ottawa, Ont.
 Supervisor of Illustration Stations, Experimental Farm, Ottawa, Ont.
 Economic Fibre Specialist, Experimental Farm, Ottawa, Ont.

ALBERTA.

Superintendent, Experimental Station, Lacombe, Alta.
 Superintendent, Experimental Station, Lethbridge, Alta.
 Superintendent, Experimental Sub-station, Fort Vermilion, Alta.

BRITISH COLUMBIA.

Superintendent, Experimental Farm, Agassiz, B.C.
 Superintendent, Experimental Station, Invermere, B.C.
 Superintendent, Experimental Station, Sidney, B.C.
 Superintendent, Experimental Station, Summerland, B.C.

MANITOBA.

Superintendent, Experimental Farm, Brandon, Man.
 Superintendent, Experimental Station, Morden, Man.

NEW BRUNSWICK.

Superintendent, Experimental Station, Fredericton, N.B.

NOVA SCOTIA.

Superintendent, Experimental Farm, Nappan, N.S.
 Superintendent, Experimental Station, Kentville, N.S.

PRINCE EDWARD ISLAND.

Superintendent, Experimental Station, Charlottetown, P.E.I.

QUEBEC.

Superintendent, Experimental Station, Cap Rouge, Que.
 Superintendent, Experimental Station, Lennoxville, Que.
 Superintendent, Experimental Station, St. Anne de la Pocatière, Que.

SASKATCHEWAN.

Superintendent, Experimental Farm, Indian Head, Sask.
 Superintendent, Experimental Station, Rosthern, Sask.
 Superintendent, Experimental Station, Scott, Sask.

**Communications should be addressed as above to reach the officers
in charge of the work indicated by the official titles.**

Seasonable Hints

For November, December, January, February.

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NUMBER 6.

NOVEMBER, 1916.

To OUR READERS:—

Cropping operations are over for 1916 but two tasks still confront us, (1) profitable disposal of harvested produce and (2) planning and preparing for 1917.

Direct marketing of all or most of the raw products from the farm is a mistake. It demoralizes the farmer, exhausts the farm and impoverishes the commonwealth. Every farmer should aim to convert at least one-half, or better still two-thirds, or even more of his crop into concentrated or finished form before selling. The advantages are many; to mention two or three, greater net cash returns possible and probable, increased soil fertility certain, and, best of all, work for the hired man the whole year round, thus progressing toward a solution of the farm labour problem. All of which, of course, leads up to what I have suggested several times already in this publication, the advisability of your getting into live stock in a small way at least, if not already practically interested. With a plentiful supply of forage in the country no better time could be chosen for making the little start. Do it right now.

At the back of this issue of "Seasonable Hints" will be found a few tables that should help you in figuring out just how you are provided with material should you decide on going into live stock, or if you are trying to decide how many head of stock you can carry. Do not make the mistake of trying to handle too many; too many is almost as bad as none at all. These tables should also prove most useful in getting seed ready for next spring and in planning your work in a general way.

A little more thought and preparation when nights are long means less lost time and more effective work when days are bright and warm and every minute counts.

J. H. GRISDALE,
Director, Dominion Experimental Farms.

LIVE STOCK.

What are we as farmers doing toward increasing either the quality or quantity of production, in order to meet the enormous present demands for food-stuffs? How can we meet the great after-war trade demands? Are we systematically preparing against possible dull markets which may follow? In other words, have we, as business men, taken a careful survey and inventory of our live stock operations with a view of increasing production at a decreased cost, by stopping waste in every form and utilizing our all too limited capital and labour to better advantage?

FEEDS.—Every pound of feed should be carefully saved and fed to obtain its maximum value. Where roughages are of poor feeding value greater care and intelligence must be used in preparation to make these more wholesome,

palatable and more easily digested. Variety is one of the great secrets of feeding. Waste no good straw; it is more valuable than low-grade hay and should be fed either cut and mixed with other roughages or fed long once daily, or the animals given free access to the straw as a supplement to the supply of better roughage, fed with a well balanced grain ration. In the absence of sufficient succulent ration, a good substitute such as molasses, beet pulp or an extra supply of grain must be provided. The stock must be kept thrifty, else they are not extracting the most value from the feeds consumed.

Mill feeds should have been purchased, co-operatively, in mid-summer when prices were low. However, if not yet purchased, buy at once. It will save at least a dollar per ton to buy in carload lots. **Remember the best grade of feed is in every way the cheapest**, costing less per pound of protein and usually being more digestible.

HORSES.—The horse market is steadily improving and promises to show continued strength. Nevertheless, greater care is needed in breeding, rearing and feeding a better class of horse which will be more suitable to Canadian markets and command higher market prices.

Horses becoming thin from under-feeding during the winter are losing money. More feed is required to put these horses in shape for the hard work of summer than would be a good maintenance ration during the whole idle season. Horses over-fed during the winter are subject to digestive troubles, become over-fat and soft, and are not in good shape for hard work in the spring. The idle work horse may be maintained in weight and condition during the winter months on a ration composed of 1 pound hay, 1 pound straw and 1 pound carrots, mangels or turnips per hundred pounds live weight. All changes in feeds, feeding and management must be made gradually.

The colt of good quality, which is growing most rapidly and kept in thrifty condition but not too fat, will make the largest horse, which will command the top market price.

All the good mares should be bred to meet future market demands. Fall foals may be reared as satisfactorily and in many cases more economically than spring foals. It is not too late to catch the mare which has not yet been bred. It is, however, advisable not to breed at all if a good stallion is not available.

DAIRY CATTLE.—Good calves of good breeding, well reared to the first calving, are by far the most profitable animals. Varying with the feeds available, prices of feeds and individuality of the animal, it costs at least \$60 to \$75 to raise a heifer to first calving (28 to 32 months of age). Other things being equal, **the poorer the bull used the nearer the dairy farmer is to bankruptcy, and the better the bull the nearer prosperity.** The best available pure-bred bull is the only animal which may profitably be used. He will pay for himself in one crop of calves. Can we not see the personal and national loss in the scrub bull, or must we await legislation regarding the registration and elimination of the scrub bull before we stop this tremendous loss.

Canadian farmers are losing millions of dollars annually by milking poor cows and rearing poor calves from them, by worthless bulls. The cost of rearing and maintaining, in feeds, labour, and interest on buildings and equipment, is the same for the profit-making cow and the cow losing from \$10 to \$30 per year. Why not give every cow and heifer a good chance through good feeding and management, then let the boarder go to the butcher? Milk records must be kept to discriminate between good and poor cows. Free milk and feed record forms may be had at this office.

In the absence of sufficient labour, rather than go out of dairying or dry the cows off prematurely, it will be found more profitable to install a good mechanical milker.

BEEF CATTLE.—Are we making the most beef from our feed? Are we raising, feeding and marketing small, weak, thin-fleshed steers, which are consuming as much as the thick, good steer which tops the market? A good beef-

bred bull of the right type is the only sire which can leave the most profitable feeding steer.

Are we winter feeding our store cattle most economically? Do not lose the thrifty condition of the yearlings or 2-year olds which are held for finishing on grass. A good winter ration is here suggested: Hay (alfalfa or clover if available), 10 to 12 pounds; roots, 40 to 50 pounds; corn ensilage, 25 to 40 pounds, or a mixture of equal parts roots and ensilage, 50 pounds; clean oat straw, 5 pounds; grain, if necessary, 2 to 4 pounds of a mixture composed of oats and barley equal parts. Lack of quality in the hay or insufficient succulent feeds—roots and ensilage—must be replaced by more and richer grain.

SHEEP.—Are you feeding ticks and lice this winter? It is not too late to dip the sheep and thus save a half of your feed and produce thrifty ewes, which can only drop and rear good lambs.

Only the very best breeding rams of good size and quality, showing particularly a heavy, good quality fleece and a strong back and leg, will produce the best feeding lambs and the most wool.

The lambs had best be separated from pregnant ewes during the winter months and fed grain as needed. Pregnant ewes during November and December require approximately: clover or alfalfa hay or unthrashed pea straw, 2 to 3 pounds; roots, or ensilage and roots, 2 pounds, per head daily. Grain should be fed only to the thin ewes. Supply water and salt regularly. During January and February, previous to lambing, grain, 1 to 3 pounds daily, should be added.

SWINE.—The money wasted in the swine industry is enormous. **Over-feeding of breeding and feeding stock is one of the main sources of loss.** Over-feeding of breeding stock will almost invariably produce small litters of weak, unthrifty pigs and a high mortality.

Under-feeding is less common, but is an equal source of danger. The under-feeding of sows and boars produces low vitality and resulting weak, small pigs in the litter. The lack of a proper balance of the ration produces disastrous results more quickly with swine than larger stock. Lack of sufficient ash and protein in the feeding of the sow produces litters weak in bone, often hairless, blind or dead at birth. Lack of exercise is another source of most fatal losses.

The use of poor boars lacking in size, quality and the desirable type, produces annually a high percentage of pigs which are poor feeders and finally take an inferior finish and in every way are less profitable. The pig which is not gaining rapidly is losing money for the feeder.

FARM BUILDINGS.—Ill-ventilated, dark, uncomfortable, foul stables are the cause of loss annually of one-third of the winter feed given to our live stock, and are also the cause of the thin, unthrifty animals so commonly found therein. Such conditions also are responsible for the rapid spread of such diseases as tuberculosis and contagious abortion, which annually cause the loss of millions of dollars for Canadian stockmen. Building new barns or remodelling old buildings without a definite, good plan usually is wasteful, for the desired results are not acquired, and all too soon other remodellings must be made. The modern barn is not necessarily extravagant. Use more cheap sheds and cabins for idle horses, colts, yearling heifers, steers, sows and the sheep, but for the other stock provide reasonably warm, well ventilated, comfortable buildings. Conveniences for handling feeds and live stock in a building will save much labour. The Animal Husbandry Division may be able to assist you with building plans free.

E. S. ARCHIBALD,
Dominion Animal Husbandman.

NOTES ON MANURE.

The more manure that can be made this winter and the better it is handled the larger will the crops of 1917 be, for whether the season be favourable or unfavourable a soil well supplied with plant food and organic matter will be more productive than one poor in these important constituents. We may go further and say that the crops on a soil so enriched are better able to withstand periods of drought, for the soil's absorptive capacity for moisture is thereby increased and there is present within each reach of the feeding roots moisture and an abundance of available nourishment for the crop's use once the weather conditions turn favourable. To a certain extent, therefore, **manure makes the farmer independent of the vagaries of the season.**

Over the larger part of Canada the cattle and live stock generally are housed in the winter, and thus it is that during this season the large proportion of manure requiring care and special handling is produced. In the summer the larger part of the manure is naturally distributed over the pastures—unless, as on a few dairy farms, the cows are stabled and "soiling" crops used. The winter's manure, therefore, is a very important asset and its care and handling matters worthy of our closest attention.

Three features connected with the production, care and application may be briefly commented on.

First.—The waste of manure in the barn through leaky and imperfect flooring and gutters. As regards nitrogen and potash, the fluid part of the excreta is far more valuable than the solid, both as regards quantity and availability for crop use. Thousands of dollars worth of this most valuable plant food that ought to be in the soils of our fields saturate the ground beneath Canadian cow barns, due to bad flooring and the want of water-tight gutters. Modern barns provide against this loss by the use of concrete. If yours are of wood, see to it before the cattle come in for the winter that both flooring and gutters are in good repair and water-tight.

Secondly.—Use a sufficiency of absorbent litter, not only to keep the cattle dry and comfortable, but also to take up and hold all the liquid portion of the manure. If the supply of straw is limited it will repay to cut it, for by so doing its absorptive capacity will be increased three-fold. Peat moss from the surface of peat bogs makes an excellent litter of high absorptive capacity. Air-dried swamp muck is also a valuable absorbent, besides adding much organic matter and plant food to the manure; a shovelful placed in the gutter behind each cow in the morning will serve to take up the liquid and greatly facilitate the work of cleaning the stable.

Thirdly.—As to the disposition of the manure in the winter, **don't leave it loose in the yard to waste by leaching, drainage and excessive fermentation.** It cannot be put *in* the soil—its safest and best storage—but if the land is not rolling and subject to surface wash it may be drawn out and put *on* the land. If the land is so wet that it would be injured by the latter method, or the snow is too deep to permit of it, put out the manure in small heaps, say of 500 to 1,000 pounds, so placed that the field may be uniformly dressed in the spring. Large heaps of many tons are sure to heat excessively, even in the coldest weather, and much of their nitrogen and organic matter is thus lost. Small heaps in cold weather will freeze through, losing nothing; in warm weather they will lose but little by excessive fermentation.

If circumstances are such that the winter's manure must be kept in large piles, keep the mass *as compact as possible*. If the manure is moist and air is excluded by tramping and otherwise compacting the heap, the fermentation will be controlled and the losses minimized.

FRANK T. SHUTT,
Dominion Chemist (Assistant Director).

FORAGE CROPS.

THE SEED SUPPLY.—The winter months are the natural period of the year for making sure of the next season's seed supply. Seed of the various forage crops that has been grown at home should be thoroughly recleaned and tested for germination. Seed of alfalfa, clovers, grasses, turnips, carrots and corn should germinate between eighty and one hundred per cent, while mangels and beet seed should, from one hundred and ten seed balls, give at least one hundred and thirty-five sprouts. Often such seed has not been properly stored, with the result that it has lost its vitality and will not grow. To guard against such a loss, see to it that all seed is stored in such a way that it will be kept dry and cool until needed.

If seed has to be purchased, make sure that the best varieties for the district are obtained. There is a great difference between the yielding power of the various varieties, and often a medium or poor crop is caused by the selection of the wrong variety. In mangels the difference between lowest and highest yielding varieties tested at the Central Experimental Farm, Ottawa, last season was 27 tons per acre. The poorer variety, although grown in the same field as the other, and under identical conditions, yielded only 20 tons per acre, while the best one gave a yield of 47 tons per acre. It is, therefore, of extreme importance that the best varieties be chosen.

The Division of Forage Plants is constantly investigating such matters, and would be pleased to offer suggestions.

ROOTS FOR SEED RAISING.—Every farmer who grows roots for his stock should have a few well selected roots carefully stored away for seed-raising next season. If these roots are stored in the cellar they should be picked over from time to time throughout the winter, and all roots that show signs of decay removed. Even if the most elaborate precautions are taken in storing, it often happens that a few roots have received undetected injuries in handling. Such roots will usually rot and spread the infection to others. Frequently one slightly injured root is the indirect cause for the loss of the entire supply of seed roots. It is, therefore, of vital importance that the roots for seed-raising be kept free from damaged and unsound roots while in storage. See Exhibition Circular No. 57.

For information on root seed raising, and forage crops in general, please write the Dominion Agrostologist.

F. S. BROWNE,
Assistant to the Dominion Agrostologist.

CEREALS.

SEED GRAIN.—Early attention should be given to the seed grain which is to be sown next spring. If no special fields for seed purposes were grown last summer, next season's requirements may be met by very careful recleaning of the main crop harvested last autumn. One can never afford to sow weed seeds, and one can seldom afford to sow grain more or less mixed with other types. The fanning mill should furnish plump seed free from weeds. If other grains are present, such as oats in wheat, or barley in oats, it will be necessary, and quite worth while, to hand-pick two or three bushels during the winter so as to have a field of an acre or two to furnish pure seed for the following year. Hand-picking may appear too laborious to any one who has not tried it, but by devoting to it an hour or two at a time a great deal can be accomplished in the course of a few weeks and without undue strain on the eyes.

If there is any doubt about the vitality of the seed, a test should be made before the winter is very far advanced.

While the laboratories of the Dominion Government are always available for farmers who desire to have an official report on their grain, any one can make a test for himself without delay by placing about two hundred seeds between layers of blotting paper or cloth, and keeping them damp for a few days. An ordinary dinner plate is very handy for this purpose, with another plate set on it in reversed position.

The grain after being moistened must not be allowed to become dry, and must not be exposed to frost. After about six days the sprouts from the seed of strongest vitality will be sufficiently developed. *Seeds which take an unusually long time to sprout generally give weak plants.* If less than about ninety per cent of the seed produces strong sprouts, it will be necessary to sow such an increased quantity as will bring the strongly vital kernels up to the usual number per acre.

CHANGE OF SEED.—The best advice in regard to change of seed is this:—
Change only when you are sure you are getting something superior to your old stock. The new grain should be true to variety and free from weed seeds. A very great danger in obtaining seed from a long distance is that it may contain new and dangerous weeds.

If you have reason to believe that the returns from your fields are less than they should be, considering the character and fertility of the soil and the time given to its preparation, it might be advisable to test some new variety of grain from the list of varieties recommended for your district. For the first season the new sort should be sown beside the old, and a careful comparison made of their relative merits.

PURCHASE OF SEED.—If new seed is to be purchased, inquiries should be made early in the winter from those who have grain for sale. No large purchase of seed should be decided upon without first seeing a sample and obtaining a statement as to its germination, and as to the quantity of other grains present. To intending purchasers of seed grain the Dominion Cerealist will be glad to furnish information as to possible sources of supply of the varieties they desire. Farmers who have seed grain for sale are requested to communicate with us.

FREE DISTRIBUTION OF SAMPLES.—A free distribution of samples of seed grain will be made from this Farm for the season of 1917. Farmers who desire to test some other variety than those they are already familiar with may obtain a free sample in this way. The quantity of seed supplied is 5 pounds in the case of wheat, barley and peas and four pounds in the case of oats. Only one sample of grain will be sent to each farm. For an application form, write to the Dominion Cerealist at Ottawa. No postage is required.

C. E. SAUNDERS,
Dominion Cerealist.

DIVISION OF BOTANY.

GRAIN RUST.—The Rust of Grain was an epidemic this season of the worst kind. Seed grain may be scarce. The yield of a rusted grain crop will show many shrivelled grains. These are of no use when sown; they will produce feeble plants, if any at all. Use the fanning mill and get rid of all under-weight and light grains. Plump kernels are the best for seed. Get your seed grain ready during the winter months. If you had much rust, try and secure seed from a crop with no (or little) rust. Early sowing, light high land and a good start on well prepared land has the best chance to escape rust. There is absolutely no treatment for rust in grain. Red Rust is merely an early stage of Black Rust.

GRAIN SMUT.—Why don't you treat your grain for smut? It may escape the rust, but the smut you are sowing with the grain unless you treat it. There is the Loose Smut in wheat and barley, which is increasing. The sooner you try a small plot treated with hot water as described in Bulletin No. 73, the

sooner you will get rid of smut. Stinking Smut is easily controlled by formalin or bluestone. Loose Smut cannot be controlled by such treatment.

WEEDS IN THE GRAIN.—There are too many farms in the West blue with Thistle, yellow with Sow Thistle, too many summer fallows green with all kinds of noxious weeds. Please bear in mind:—**one year's seeding may mean seven years' weeding, so sow clean seed.**

THE ORCHARD.—Fungi which cause serious losses to the fruit grower live through the winter on fallen leaves, fruit, dead branches and pruning trash. Do not give them a chance to attack your fruit again in spring. Destroy all rubbish by fire. Do not forget the good results from a winter or dormant spray. Read the Spray Calendar issued by the Central Experimental Farm, and follow the advice given.

STORAGE ROTS OF ROOTS AND POTATOES.—Ventilation and low temperature (not freezing) are the whole secret of successful root storage. If you provide for these, your crops will be in perfect condition at a time when they command the highest price. Potatoes last year were very high. The farmer with a good cellar or storage was the winner; the farmer with a bad cellar the loser. Will you win this season?

H. T. GÜSSOW,
Dominion Botanist.

THE CULTIVATION OF MEDICINAL PLANTS.

Persons desirous of cultivating medicinal plants for profit should pay careful attention to the following points:—

- (1) In some species several years must elapse between the time of sowing the seed and reaping the first crop.
- (2) Most of the labour of collecting, drying, sorting and packing is of such a nature that it requires to be done by hand.
- (3) The demand for many species of medicinal plants is comparatively limited. Overproduction will cause the price to fall, or it may even happen that the grower will be unable to find a market for them.
- (4) Probably the only satisfactory way of growing medicinal plants for profit would be to make an agreement with one of the larger firms of drug manufacturers to take a specified quantity of the drug at a certain minimum price, the price to be increased according to the quality of the article offered.

J. ADAMS,
Assistant Dominion Botanist.

FIELD CROPS.

PLoughing.—Fall plough where practicable all land intended for grain and roots next year, but sod land, intended for corn, other than heavy clay, may be ploughed advantageously in the spring.

Plough thoroughly, for the quality of the ploughing done indicates to a large extent the calibre of the man as a farmer. It is the basic cultural operation in the preparation of the seed-bed where the uniformity of the ploughing, the condition of the crown, and the best clean up of furrow means much by way of facilitating other operations in the preparation of that land for seed and the harvesting of the crop.

DRAINAGE.—Outlets, sand traps or silt basins and drains, if necessary, should receive attention before winter sets in. They should be cleaned of all obstructions, and where necessary repaired, in order that the entire drainage system will be in proper condition to carry all surplus water with the least possible delay in the spring.

Where ample underdrainage is not provided considerable aid can be given to facilitate the ridding of the land quickly of surplus water in the spring by opening the ends of furrows to carry the water at least off the cultivated land.

MANURE.—Should be applied to the land with as little loss as possible, hence under ordinary conditions it is an economical practice to spread the manure directly from the stable to the land until such time as the snow becomes so deep as to necessitate the discontinuance of the practice. In spreading by hand—which is necessary once winter sets in—care should be taken to spread all manure as evenly as possible. In too many cases manure supposed to be spread is merely forked out, causing an unequal distribution of the manure.

OBSTRUCTIONS.—Unnecessary fences on the farm may be conveniently removed during this season of the year. Fences harbour and provide breeding places for plant diseases and insect pests; hinder the economical use of large labour-saving implements and provide no return for money expended in them, hence, only those absolutely necessary should be allowed to remain. Trees and stones in cultivated fields are a menace to farm machinery, retard work and curtail crop yields.

CARE OF IMPLEMENTS.—Implements that have been used for some time should be inspected and the worn parts adjusted or replaced. In the farm workshop in the winter when field work is not pressing, this important work can be accomplished and will practically do away with that aggravating “tinkering” during the busy season. Another advantage is that repairs required from the factory can be delivered more promptly, and time will permit of a thorough job of repairing being done.

An application of paint not only improves the appearance of the implement, but aids in preserving those parts especially that are composed of wood. Paint of good quality only should be used, and the surfaces to be painted should be dry and clean before the paint is applied.

W. L. GRAHAM,
Assistant Field Husbandman.

FRUITS, FLOWERS AND VEGETABLES.

STORAGE.—The storage of fruits and vegetables so that they will keep in good condition as long as possible after harvesting is one of the most important things to have in mind and to be prepared for. Apples should be kept in as low a temperature as possible above freezing; a good temperature being between 32° and 38° Fahr. A cellar which is inclined to be moist is better than one very dry, as in the latter case the fruit is liable to wither and lose its crispness. When a cellar is not available, the coolest place in the house where it does not freeze should be chosen. Wrapping each fruit in paper and keeping them in closed boxes or barrels will preserve them better and keep them crisper than if they are not so treated. Avoid using dirty receptacles in which to store them as these often impart an unpleasant flavour to the fruit.

Potatoes, carrots, beets, parsnips and turnips need a cellar which is moderately dry, but well ventilated; a very wet or very dry cellar is not a good place to keep them. The temperature should be a few degrees above freezing. Cabbage should be kept outside as long as possible. A good plan after harvesting is to put them close together and cover them with straw, later on putting more straw and soil over to prevent frost getting at them. If the cellar is cool and very dry they may be kept satisfactorily there. Where conditions are dry they keep better with the roots and stems left on.

Celery should be kept in a cool, moderately dry, well ventilated cellar for best results. Plant the celery in rows close together in sand, or light soil, separating each row with a lath or other piece of wood to keep the tops a little apart and better ensure a good circulation of air. The soil should be moist,

but the tops dry if celery is to be kept well, and in watering avoid wetting the tops.

PRUNING BUSH FRUITS.—Time will be saved in the busy season if bush fruits are pruned in the autumn. Thin out the gooseberry and currant bushes so that the bush will have a rather open appearance, cutting away any very old wood and some of the weakest of the new wood in the case of gooseberries and red currants, but remembering that **canes of this season's growth will bear most of the fruit on black currant bushes next year;** hence a plentiful supply of these should be encouraged and kept. The dead wood and the weakest of the raspberry canes should be removed, leaving the remaining canes five to six inches apart.

WINTER-FLOWERING BULBS.—Many a farmer's house could be made brighter from November until spring if a very few dollars were spent in the purchase of flowering bulbs such as Daffodils, Hyacinths and Tulips. They are planted in pots in the autumn—early in November is on the late side—and kept watered in the cellar until the bulbs are well rooted, when they may be brought up and forced as desired. Any seedsman and many drug stores have these bulbs for sale.

PROTECTION FOR STRAWBERRIES, GRAPES, ROSES.—Last year, readers were reminded of the importance of lightly mulching strawberries with straw before winter set in, to protect them from changes of temperature; and of the protection of grapes and roses, in cold districts, by covering them with soil; these recommendations are again made.

PROTECT TREES FROM MICE.—Readers are strongly advised to protect fruit trees from mice by wrapping the trunks with building paper, taking care that the soil is heaped up around the paper a little at the base so that the mice cannot get between the paper and the tree. Many orchards are ruined by mice, and trees should be protected from their ravages before snowfall every year. If the paper has not been put on before the snow comes, tramp the latter well around the trunks of the trees which will help to prevent mice getting at the trunks.

SEED ORDERS.—The early ordering of seed usually ensures getting what one desires, while delay often brings disappointment. Order as soon as the catalogues appear.

W. T. MACOUN,
Dominion Horticulturist.

BEES.

WINTERING IN THE CELLAR.—Bring the bees into the cellar as soon as possible after the last good cleansing flight that they are likely to get; in most places this is usually early in November. To bring in the bees, the entrances may be closed with soft paper which should be removed when all the hives are inside. Inside the cellar the entrances should be large; the width of the hive by about an inch deep is usually a sufficient size. The temperature of the bee-cellar should be kept between 40° and 45°, and sufficient ventilation should be provided. The air of the cellar should neither be saturated with moisture nor very dry. A dry cellar with running water is a good combination. The bee-cellar should be kept dark. It is a good plan to partition off a corner of the cellar in the basement of the bee-keeper's residence for the bees. Mice should be kept out of the bee cellar.

WINTERING OUTSIDE.—In many places where the winter is moderately cold bees are now being wintered outside in wintering cases constructed to hold four hives each, each pair of hives being placed back to back. There is a space of two or three inches between the sides of the case and the hives, and in the colder regions underneath also, and ten inches above the hives; all these spaces being

filled with planer shavings or other insulating material. The bees are allowed to fly through small entrances made in the sides, and ventilation is provided under the roof, which consists of light boards covered with waterproof sheeting. The bees will come to no harm if the entrances get buried under soft snow. For wintering outside, it is important that the apiary be well sheltered from wind by, for instance, evergreens or a high board fence.

SUPPLIES.—The winter is the best time for the purchase and preparation of bee supplies. Frames should be made up and wired ready to receive the foundation. The beginner will make no mistake if he adopts the ten-frame Langstroth hive as standard, and prepares a good supply of extracting supers to take Langstroth frames. A telescoping hive-cover packed with excelsior or shavings and covered with waterproof sheeting is better than a plain cover made of a single thickness of board, as it helps to conserve the heat in spring and to protect the bees from hot sunshine in summer. It is advisable to delay the purchase of foundation until spring because it is brittle in cold weather.

EMPTY COMBS.—Next to the bees, the most valuable asset of the extracted-honey producer is a plentiful supply of good, clean, empty combs. Empty combs should be stored for the winter in the supers, which should be tiered up with newspapers between each, and a cover on top to exclude mice. To prevent the wax moth from working in the combs they should be kept in a cold place.

F. W. L. SLADEN,
Apiarist.

TOBACCO CULTURE.

QUALITY.—As far as the tobacco grower is concerned the quality of his crop depends much on the care given to the leaf while it is hanging in the curing barn or kept in the farmer's store room.

DRYING.—When fat stems are still noticed in November, the safest way is to dry them thoroughly by the use of artificial heat. This can easily be done by using charcoal heaters. Charcoal fires can be checked by covering them with ashes, and in this way keeping the atmosphere sufficiently dry and warm to complete the reduction of the fat stems.

When the leaf is thoroughly cured a slight raise in the temperature of the curing barn does not hurt the foliage, but as long as the curing of the leaf proper is not complete one should take care not to raise the temperature over 60° or 65°.

TAKING DOWN, STRIPPING AND GRADING—Most of the buyers insist on having the crop delivered to the factories or the warehouse graded by the farmer in top leaves, middle leaves, bottom leaves and trash. The buyers claim that when they can accurately judge the quality of the crop they are ready to pay a better price; at any rate, it has been proved that when the leaves have been sorted the crop generally finds a more ready market. One should insist especially in taking the trash from the bottom leaves. Although bottom leaves are a little dry in texture when they are in a sound condition they can command a pretty fair price, but they should not include any trash.

After being stripped and tied into hands the tobacco should be kept loose in a comparatively cool place, not too dry, where it will keep in case until time of delivery or shipment to the buyer. It will then be baled, care being taken to protect the bales with good wrapping paper so as to avoid bruising the outside leaves during transportation.

It is very important to avoid in the storeroom any excess of moisture, which will be dangerous even if the temperature of the room is pretty cold.

F. CHARLAN,
Dominion Tobacco Husbandman.

POULTRY.

NOVEMBER.

Begin the month right by starting to keep accurate account of your receipts and expenditures. A simple way to keep track of the grain used is to have a supply bin in the poultry house. The grain can be easily weighed and the amount recorded each time the bin is filled.

THE STOCK.—By the beginning of this month, pullets should have been in their winter quarters several weeks and should be either laying or just about to begin. Give them regular attention; see that the hoppers are kept well supplied and that the water pans are kept filled. Be sure that the hens and pullets are in separate pens as it is impossible to do justice to both where they are running together.

FEEDING.—The pullets should be fed heavily for egg production and the hens—the breeders—fed on a light ration. Feed the pullets mixed grain morning and evening. This should be buried in a deep litter to make them work for it. Keep a hopper filled with dry mash before them. The feeds used both for grain and mash feeding will depend on what are most available. Wheat, barley, oats, corn, buckwheat are all excellent, but they are better mixed than any one fed alone. Bran, middlings or low grade flour and cornmeal, equal parts with half part blood-flour or beefscrap makes a good mash. If gluten meal can be had at a reasonable price half a part may also be added. Give them a regular supply of sour milk or keep a hopper of beefscrap where they can get what they want; also hoppers of grit and oystershell, and don't forget the green feed; mangels are one of the best and most convenient forms that can be used; a forkful of clover hay put in a rack where the fowl can have access to it will be appreciated.

The old hens should be fed sparingly and kept busy. Instead of the mash recommended for the pullets give them dry bran, cr, if the mash is used, the hopper should be only opened for a limited time each day.

MARKET.—This is a good time to look up a market; eggs are scarce and retailers will be eager to get a regular supply.

CRATE FEEDING.—Continue crate-feeding. Do not try to dispose of all your surplus cockerels as soon as the cold weather comes. See that they are properly fleshed and if you are selling them dressed see that they are properly killed. Sticking, bleeding and then dry picking is the proper method. (See Exhibition Circular No. 70.)

DECEMBER.

The work for December is largely a continuation of that of November. See that the houses are all ready for winter, that there are no draughts, and that the fences have been made ready for next spring's breeding. Winter is liable to set in anytime now; see that you are not caught unprepared.

This is the month that most of the turkeys and geese will be disposed of. Instead of depending on the wholesale market, get in touch with the consumer. When you put up your birds to feed, insert a small advertisement in a newspaper in your nearest city or town offering specially fed turkeys or geese for Christmas delivery. You can thus secure the retailers price and the consumer will get a first-class article in that it will have been properly fleshed and will be delivered unfrozen.

JANUARY AND FEBRUARY.

During these months as much time as possible should be spent studying your flock, so that by the time mating season arrives you will have made up

your mind exactly what birds you want and what birds you do not want to use for breeding. Of course, if you have reserved enough good breeding hens from your last seasons' pullets you will be all right, but if you find that you will require more hatching eggs than the hens you have will give you it will be necessary to select a pen of your best pullets.

If you have been fortunate enough to have used trap nests, you will know by this time what pullets will make the best laying records, as it is the early maturing birds that come out on top. If you have not used trap nests you should band the pullets as they begin to lay and keep track of them so that you can reserve the best for breeding next season. Let your breeding hens "rough it". Give them the run of the barnyard if possible; if not, keep the house wide open so that they will get all the fresh air and sunshine possible. Feed light, bury all the grain feeds in the litter, and see that they have all the green feed they will eat, so that they will come into the breeding season in the best possible condition.

Fresh killed, crate-fed stuff always brings high prices during these months. Your late cockerels should now be ready and capons will be eagerly snapped up at top notch prices.

GEO. ROBERTSON,

Assistant Poultry Husbandman.

USEFUL FACTS FOR FARMERS.

LEGAL WEIGHTS OF PRODUCE IN CANADA.

	Pounds per bush.		Pounds per bush.
Artichokes.....	56	Hungarian Grass.....	50
Barley.....	48	Lime.....	70
Beans (Castor).....	40	Millet Seed.....	50
Beans (White).....	60	Oats.....	34
Beets.....	50	Onions.....	50
Blue Grass Seed.....	14	Parsnips.....	45
Buckwheat.....	48	Peas.....	60
Carrots.....	50	Potatoes.....	60
Clover Seed.....	60	Rye.....	56
Corn, in the ear.....	70	Timothy Seed.....	48
Corn, Shelled.....	56	Turnips.....	50
Flax Seed.....	56	Wheat.....	60
Hemp Seed.....	44		

POUNDS PER BAG.

Artichokes.....	84
Beets.....	75
Carrots.....	75
Onions.....	75
Parsnips.....	65
Potatoes.....	90
Turnips.....	75

POUNDS PER BARREL.

Flour.....	196
Meal.....	196
Rolled Oats.....	180
Rolled Wheat.....	100

TO FIND TONS OF HAY IN A MOW.

To find the number of tons of hay in a mow, multiply length by depth by breadth in feet and divide by 450. In case of straw, divide by from 600 to 1,000, according to the length of time in mow. The longer the time in mow, the smaller the divisor to be used.

Hay in stacks is usually not quite so solid as in mows, hence 500 should be used as a divisor rather than 450. These divisors apply to Eastern Canada. In Western Canada, wild hay being heavier, a smaller divisor should be used, say from 350 to 400.

TO FIND WEIGHT OF GRAIN IN A BIN.

Ascertain cubical contents of bin, and weight of one bushel (32 quarts) of the particular kind of grain.

As 1 cubic ft. measures 25 quarts (nearly), the weight of 1 cubic ft. will be 25-32nds. of the weight of 1 bushel.

Example,—1 bushel oats weighs 34 pounds. 1 cubic ft. of oats equals 25-32nds. of 34 pounds, or $26\frac{1}{2}$ pounds.

QUANTITY AND WEIGHT OF SEED TO THE ACRE.

	Pounds.	Bushels.
Alfalfa.....	16—20	.....
Alsike.....	3—5	.....
Barley, six-rowed.....	96—120	$2\frac{1}{2}$
Barley, two-rowed.....	120—144	$2\frac{1}{2}$ —3
Buckwheat.....	40	.....
Corn, in hills 3 ft. apart.....	20—30	.....
Corn, in rows $3\frac{1}{2}$ ft. apart.....	25—40	.....
Flax for fibre.....	70—80	.....
Flax for seed.....	30—40	.....
Hungarian Grass.....	40	.....
Mangels, Sugar Beets and Sugar Mangels.....	8—10	.....
Millet.....	30	.....
Oats (The larger the oat kernel the more seed required). .	80—120	$2\frac{1}{2}$ — $3\frac{1}{2}$
Peas (The larger the pea the more seed required). .	120—240	2—4
Potatoes (according to size of seed used). .	720—1200	12—20
Rape.....	4—5	.....
Red Clover.....	8—10	.....
Rye.....	44	$\frac{3}{4}$
Timothy.....	6—12	.....
Turnips.....	4—6	.....
Vetches (according to size). .	60—90	$1\frac{1}{2}$
Wheat (Spring). .	90	$1\frac{1}{2}$
Wheat (Winter). .	75	$1\frac{1}{4}$
Wheat (Winter for Western Canada). .	45	$\frac{3}{4}$

HAY MIXTURE, ONTARIO AND QUEBEC, ON WELL DRAINED LAND.

	Pounds per acre.
Alfalfa.....	6
Red Clover.....	8
Alsike.....	2
Timothy.....	10

YOUR CORRECT ADDRESS.

If you receive more than one copy of this pamphlet, please cut out the address on each wrapper and mail to us. State which is your *correct* address. No postage is necessary, from points in Canada, on communications addressed to the Central Experimental Farm, Ottawa.

We will forward application forms to any persons wishing
to have their names entered on our mailing list.